

Numerical Investigation of Heat Transfer in a Channel with Delta Winglet Vortex Generators at Different Reynolds Numbers

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Abstract : In this study the augmentation of heat transfer in a rectangular channel with triangular vortex generators is evaluated. The span wise averaged Nusselt number, mean temperature and total heat flux are compared with and without vortex generators in the channel at a blade angle of 30° for Reynolds numbers 800, 1200, 1600, and 2000. The use of vortex generators increases the span wise averaged Nusselt number compared to the case without vortex generators considerably. At a particular blade angle, increasing the Reynolds number results in an enhancement in the overall performance and span wise averaged Nusselt number was found to be greater at particular location for larger Reynolds number. The total heat flux from the bottom wall with vortex generators was found to be greater than that without vortex generators and the difference increases with increase in Reynolds number.

Keywords : heat transfer, channel with vortex generators, numerical simulation, effect of Reynolds number on heat transfer

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